Technical Specifications

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Technical Specifications and Setup Information

SOS at the Stennis Space Center in Mississippi

Introduction

Once the exhibit space for Science On a Sphere® has been designed according to the guidelines in the First Steps document, the next step to take is selecting the equipment to be used. All of the equipment for Science On a Sphere®, with the exception of the sphere itself, is off-the-shelf equipment that can be purchased from numerous sites. A generic list of equipment is available, however the needs of each site vary, so it is important to discuss with the SOS team the equipment needs for your site.

Computers and Graphic Cards

There are very precise computer specifications for the computers that operate SOS. Sites are encouraged to buy two computers - one operational computer, and one spare. Both computers are configured identically for easy replacement should the operational computer encounter any problems. Due to the graphic demands of SOS, one third-party, high-end graphics card needs to be purchased separately for each system (total of two additional cards cards) in addition to the basic card that comes in the computers. With these graphics cards, the computers generate a fair amount of heat, so it's important that the computers are kept in a well ventilated area.

Cabling

The computers are connected to one another through a private gigabit network that is used to sync the

computers. An 8 port gigabit network switch and Cat 5e or Cat 6 cabling are required to connect the computers to the network. The projectors can also be connected the network to allow for remote control through the main SOS computer. It is important that the right cabling be used to ensure proper system operation.

Wiring Diagram

Typically the computers, network switch, and components are stored in one central location, along with a keyboard, mouse, monitor and KVM. DVI video extenders with Cat 6a cables are used to connect the projectors to the computers. The cable length for the videos extenders needs to be less than 200'. DVI cables are used to connect the extenders to the projectors and the computers, so make sure to have enough DVI cables. When considering a computer location, temperature and air flow of the space needs to be taken into account. The computers generate a fair amount of heat and need to remain cool, so they need to be stored in a location with good ventilation. Conditions with poor ventilation can lead to overheating for the computers which can cause failures in the hard drive, motherboard, graphics cards, processors and other components. It is convenient, though not required to be able to see the sphere from the computer location for programming purposes.

Audio System

An audio system serves to enhance the Science On a Sphere® exhibit by allowing the site to play narrated pieces and use microphones for presenters. The details of the audio setup are left up to each site, but specifications for a reference audio system are provided. This basic system includes a mixer, a microphone, and four speakers. The speakers are typically mounted near each of the projectors and are positioned to point in towards the sphere. When designing the SOS exhibit, it is important to consider how sound will travel between the SOS exhibit and any surrounding exhibits, and to plan accordingly.

Remote Control

In order to perform projector alignment of the sphere and give live presentations, a remote control is required. The remote control available for SOS is an iPad, iPhone or iPod Touch. For this to work there, there must be Wi-Fi access to the SOS computer. Either an existing Wi-Fi network can be used, or a dedicated network can be set up for SOS. For the most reliable connection, a dedicated Wi-Fi network for SOS is recommended.

Power

The projectors draw about 20 amps and the rest of the equipment, including the computers, draws about 7 amps. A UPS is suggested for the computers to protect them from power spikes and bumps. Sites should consider putting projectors on UPS units as well, especially if the site has unreliable power. Power should be readily accessible from each of the projector locations, as well as at the central computer location.

Internet Access

Another nice feature to add is an internet line. This serves several purposes. First, it allows the site to automatically download real-time data for display on the sphere. It also lets the sites automatically download weekly updates to the data catalog and stay up to date with software upgrades. Second, if the site's security permits it, it allows the SOS team to log in remotely to the computers and do any troubleshooting or maintenance required. A program called TeamViewer is used for remote access. It's set up in such a way that the SOS support tech is only able to log in when invited to do so by a site. Internet speeds of 3-4 Mbps are suggested. A Wi-Fi router is part of the equipment list so that a wireless network can be set up to allow

for remote control of the sphere with an iPad or iPod Touch.

Auxiliary Displays at NOAA's Earth System Research Lab, Boulder, CO

Additional Options

Many sites choose to customize their Science On a Sphere® exhibit through the addition of touch-screen kiosks and/or auxiliary displays. A kiosk from the NOAA SOS team is available in addition to an auxiliary display system from the University of Colorado. Information about the NOAA SOS Public Kiosk is available here. The auxiliary display system was written by two students at the University of Colorado and is freely available. This software links PowerPoint with Science On a Sphere, allowing a corresponding PowerPoint show to play on auxiliary monitors during SOS presentations. Details and instructions for the CU Auxiliary Display Software are available online. Because the CU Auxiliary Display software was not written by NOAA, support is limited.